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STUDIES ON ETHIDIUM BROMIDE

I.—The Treatment of Early *T. vivax* Infection in Cattle

BY

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INTRODUCTION

The therapy of syringe passaged *T. congolense* infections in cattle with ethidium bromide (2 : 7 diamino-10-ethyl-9-phenyl-phenanthridinium bromide) was first described by Wilde & Robson (1953) and later by Wilson & Fairclough (1953). As far as the writers are aware, there is no published record of the activity of the drug against *T. vivax* infection, although Fairclough (1953) has carried out a small-scale trial at Kabete in which five infected cattle were successfully treated with a dose of 0·25 gramme ethidium, roughly equivalent to 1 mg. per kg. bodyweight.

METHODS AND RESULTS

The experiment was carried out at Khartoum using one and a half to two-year-old bulls from the Northern Sudan. These animals were tested for contact with bovine pleuropneumonia by a flocculation test ; positive reactors were discarded and the rest injected with an attenuated serum broth vaccine. Each animal received lapinised rinderpest vaccine and they were then tethered in shaded compounds and fed on burseem and durra stalks. Wet smears from an ear vein were examined in the early morning of three consecutive days to ensure absence of previous trypanosome infection and then each of 40 animals was given 5 c.c. of citrated blood from a natural case of *T. vivax* infection from the Malakal district. Commencing five days after this injection daily early morning wet blood smears were examined to observe the rise of the infection. In each case about 200 fields were examined using the 1/6 objective. By the 14th day three animals had died ; one from pleuropneumonia and two from what was adjudged to be clinical trypanosomiasis. Thirty-five of the remaining 37 showed *T. vivax* in blood smears and were randomised into groups of seven. The animals in four of these groups were treated at the following rates—0·25, 0·5, 1·0 and 1·5 mg. per kg. live weight and there was one group of infected controls. Two further animals became blood positive two days later and were allocated to the 1·0 and 0·5 mg. per kg. groups and treated accordingly.

The drug in a 1 per cent. aqueous solution was administered subcutaneously on the side of the thorax behind the scapula. The area was massaged to disperse the drug in the subcutaneous tissues. In all cases there was some tissue reaction varying from a small area of subcutaneous thickening at the low dose levels to a flat plaque-like swelling up to 6 inches in diameter at the highest dose levels. In some of these cases there was a circumscribed area of oedema below the injection site. In no case did skin necrosis occur and with the passage of time the reactions hardened and decreased in size although in many cases careful examination at the end of the experiment disclosed a persistent subcutaneous thickening.

From the day following treatment thick blood smears were collected every morning, stained by a modified Fields method as described by Neave (1952) and examined for the presence of trypanosomes. Using the 1/12 objective, about 200 fields were examined on each smear. The results are shown in the accompanying table.

Although the experimental cattle were sprayed twice weekly with a BHC suspension, some biting flies were seen in the compounds and it was felt desirable to check on the possibility of cross infection occurring from untreated controls. For this purpose two untreated, uninfected animals were tethered alongside the seven controls and daily blood smears examined. These nine animals were in a separate compound from the treated groups. Thirteen weeks after the commencement of the experiment both the cross infection controls showed numerous trypanosomes in blood smears, yet when observations were terminated at the end of 18 weeks only one trypanosome had been seen in a treated animal, *i.e.*, one in the 1·0 mg. per kg. group in the first

TREATMENT OF *T. vivax* INFECTION WITH ETHIDIUM BROMIDE

Group	Number of bulls at commencement	Dose	Daily blood examinations. Number of bulls showing one or more positive slides during week																Number of bulls at end of experiment
			Before treatment	Weeks after treatment															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
I	7	0·25 mg. per kg.	7	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
II	8	0·5 mg. per kg.	8	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8
III	8	1·0 mg. per kg.	8	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8
IV	7	1·5 mg. per kg.	7	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
Control	7	0	7	7	7	7	7	7	6	5	5	4	5	5	5	4	2	4	3	5
Cross infection control	2	0	—	—	—	—	—	—	—	—	—	—	1	2	2	2	2	2	2	2

N.B.—The positive slides in post-treatment week 1 all occurred the day after dosing. In week 2 one trypanosome was seen on one day in the blood of one animal in Group III.

week after treatment, excepting of course those animals that remained positive for 24 hours after treatment.

Discussion

Of the four deaths occurring after the day of treatment two in the treated animals were due to piroplasmosis and theileriasis and two in the controls were attributed to trypanosomiasis. It appears, therefore, that the strain of *T. vivax* used was not one that produced a high mortality within the 18-week period of the experiment. The usual course of *T. vivax* infection in the Sudan is a chronic emaciation and anaemia without a high death-rate from trypanosomiasis *per se* although the infected animals will presumably be very susceptible to intercurrent disease and periods of pasture shortage. Unfortunately, it was not possible to include either regular weighings or haemoglobin estimations in the experiment but at the end of the observations there was no doubt that the treated animals were in better general condition than the surviving controls. Taking as the criterion of cure the absence of trypanosomes from the peripheral blood for a period of 16 weeks the treatment was successful in Groups I, II, III and IV.

Ethidium bromide is therefore active against a Sudan strain of *T. vivax* at a dose as low as 0·25 mg. per kg. Burdin (1953) has found no delayed toxicity at a level of 4 mg. per kg, therefore the therapeutic ration is wide.

Mornet & Mahou (1949) found 2 mg. per kg. of dimidium chloride necessary to cure *T. vivax* infection whereas delayed toxicity has occurred with doses as low as 1 mg. per kg. of the bromide, Thorold & Plowright (1952). With antrycide methyl sulphate Davey (1950) used 2 mg. per kg., yet Garner (1950) found 7·5 mg. per kg. necessary to cure *T. vivax* and this dose produced toxic symptoms.

Ethidium bromide appears to be a distinct advance on the current trypanocidal drugs when used to cure *T. vivax* infections and there seems to be ample margin to allow of an increased dose if some field strains prove more resistant to treatment than did the one used in this experiment.

Summary

Treatment of 30 cattle, syringe infected with *T. vivax*, with ethidium bromide at levels ranging from 0·25 to 1·5 mg. per kg. cleared the blood of trypanosomes within 48 hours and maintained this freedom during daily observations for a period of 16 weeks. There were two deaths from trypanosomiasis out of seven untreated controls and none in the 30 treated animals.

Acknowledgments.—This experiment is one of a series arranged jointly by the Research Department of Boots Pure Drug Co., Ltd., and the Sudan Veterinary Service, and we wish to thank the Director, Mr. J. T. R. Evans, B.Sc., M.R.C.V.S., and the staff of the latter organisation for their generous assistance in the carrying out of the work.

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KEEPING QUALITIES OF LIVE RINDERPEST VACCINES

BY

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In East Africa, the demand for caprinised (K.A.G.) and lapinised rinderpest vaccine fluctuates from month to month, the most important factor being the onset of heavy rains which hinder travel of the field officers. Due to the unpredictable and irregular requirements, stocks of vaccine have to be built up during the slack periods; at Kabete, the live rinderpest virus vaccines, dried and under vacuum, are stored in deep-freeze machines at — 4° to — 22° F. (— 20° to — 30° C.).

Kerr (1935) kept goat-adapted rinderpest vaccine in sealed tubes at 45° F. (7·2° C.), and it was potent after 30 days' storage. Phadke, Deen & Hardikar (1937) stated that the virus in fresh infected goat spleen was conserved for 40 days in a refrigerator. In 1938, Pfaff recorded that dried infected goat spleen was capable of producing a reaction in cattle after 141 days' exposure at 42° F. (5·6° C.). Daubney & Hudson (1939) showed that dried K.A.G. vaccine kept in rubber-stoppered tubes under vacuum at 33·8° F. (+ 1° C.) dropped in titre from 1 : 100,000 at 24 hours' storage to 1 : 10,000 after three months; at six months the titre had fallen to 1 : 1,000, but by that time the vacuum in the tubes had been lost.

With regard to lapinised rinderpest vaccine: Peng, Shu & Cheng (1948) recorded that a lyophilised product, under vacuum, maintained its potency at 39·2° F. (4° C.) for at least 105 days. Scott & Brotherston (1952) proved the viability of freeze-dried vaccine under various conditions but at temperatures above 64·4° F. (18° C.), after previous storage for six weeks at — 4° to — 22° F.; while Brotherston (1951) noted that 0·1 g. of lapinised vaccine was viable when injected into rabbits after storage under vacuum for 25 months at — 4° F.

This paper presents critical information about the storage of live rinderpest vaccines at low temperatures.

Materials

Virus Vaccine Preparations.—Different routine batches of caprinised rinderpest vaccine (K.A.G.) prepared by the technique described by Brotherston (1950), and also batches of lapinised rinderpest vaccine as described by Brotherston (1951), were re-titrated after having been stored at — 4° to — 22° F. for varying periods.

The final moisture content of ampoules of K.A.G. vaccine varied between 1·8 and 2 per cent.; that of lapinised vaccine was always below 1 per cent. Ampoules of vaccine were sealed originally at a vacuum of 0·1 mm. of mercury.

The method of titration was carried out as follows, each ox receiving 2 ml. of the dilution subcutaneously :—

Dilutions of Dried Vaccine

2 ml. of	1 : 10	equivalent to	0·2 g.	of dried vaccine.	
„	1 : 2,000	„	0·001 g.	„	„
„	1 : 4,000	„	0·0005 g.	„	„
„	1 : 10,000	„	0·0002 g.	„	„
„	1 : 20,000	„	0·0001 g.	„	„
„	1 : 40,000	„	0·00005 g.	„	„

Cattle.—High grade European-Zebu cross steers were utilised throughout. These animals were purchased from European farms as being unprotected against rinderpest and the great majority were fully susceptible to the disease. Occasionally a resistant animal was encountered and two such appeared in Table III.

Method of Challenge.—All cattle were challenged three to four weeks after the commencement of titrations, by the subcutaneous injection of 1 g. of fresh virulent rinderpest spleen tissue (Kabete " D " strain, 100,000 M.I.D.).

Methods

Immediately after preparation, every batch of both caprinised and lapinised vaccine had been titrated in cattle. As shown in Tables I and II, the K.A.G. vaccine had protected at dilutions of 1 : 40,000 and the lapinised vaccine had proved an effective immunising agent at 1 : 10,000. At this time a few ampoules from each batch of vaccine had been retained and stored at — 4° to — 22° F.

These ampoules were removed and re-titrated after varying periods of storage at this low temperature ; in the case of lapinised vaccine, an additional higher dilution was tested. These results are shown in Tables III and IV.

Table I

Results of Titrations in Cattle of Various Batches of Caprinised Rinderpest Vaccine (K.A.G.) Prior to Issue to the Field

Batch No.	Cattle titration: Control		0·2 g.		0·0002 g.		0·0001 g.		0·00005 g.	
	T.R.	C.	T.R.	C.	T.R.	C.	T.R.	C.	T.R.	C.
CK 14– 7	—	S	•	I	•	I	•	I	•	I
VK 7– 6	—	S	•	I	•	I	•	I	•	I
CK 12–15	—	S	•	I	•	I	•	I	•	I
VK 5– 8	—	S	•	I	•	I	•	I	•	I
CK 12– 3	—	S	•	I	•	I	•	I	•	I

Table II

Results of Titrations in Cattle of Various Batches of Lapinised Rinderpest Vaccine Prior to Issue to the Field

Batch No.	Cattle titration: Control		0·2 g.		0·001 g.		0·0005 g.		0·0002 g.	
	T.R.	C.	T.R.	C.	T.R.	C.	T.R.	C.	T.R.	C.
K 9–61	—	S	—	I	—	I	—	I	—	I
K 9–62	—	S	—	I	—	I	—	I	—	I
K 18–33	—	S	—	I	—	I	—	I	—	I
K 18–34	—	S	—	I	—	I	—	I	—	I
K 18–35	—	S	—	I	—	I	—	I	—	I

Table III

Caprinised Rinderpest Vaccine (K.A.G.)
Potency as judged by cattle inoculation following storage at —20° to — 30° C.

Batch No.	Period stored (months)	Cattle titration: Control		0·2 g.		0·0002 g.		0·0001 g.		0·00005 g.	
		T.R.	C.	T.R.	C.	T.R.	C.	T.R.	C.	T.R.	C.
CK 14– 7	11	—	I (1)	•	I	•	I	—	I (1)	•	I
VK 7– 6	11·5	•	S	•	I	•	I	•	I	•	I
CK 12–15	20	•	S	•	I	•	I	•	I	—	S
VK 5– 8	23	•	S	•	I	•	I	•	I	•	I
CK 12– 3	25	•	S	•	I	•	I	—	S	•	I

Table IV

Lapinised Rinderpest Vaccine
Potency as judged by cattle inoculation following storage at — 20° to — 30° C.

Batch No.	Period stored (months)	Cattle titration: Control		0·001 g.		0·0005 g.		0·0002 g.		0·0001 g.	
		T.R.	C.	T.R.	C.	T.R.	C.	T.R.	C.	T.R.	C.
K 9–61	6	—	S	—	I	—	I	—	I	—	I
K 9–62	6	—	S	—	I	—	I	—	I	—	I
K 18–33	12	—	S	—	I	—	I	—	I	—	I
K 18–34	12	—	S	—	I	—	I	—	I	—	I
K 18–35	12	—	S	—	I	—	I	—	I	—	I
K 18–33	14·5	—	S	—	I	—	I	—	I	—	I

Note : (1) = animal immune before entering experiment.
T.R. = column for thermal reactions, if any.
C. = column for results on challenge.
• = thermal reaction present.
— = no thermal reaction.
S = susceptible on challenge.
I = immune on challenge.

Results

Caprinised Rinderpest Vaccine (K.A.G.).—A comparison of Tables I and III shows that there was no loss in titre after storage for 11 and 11½ months in the deep-freeze, and even after 20 and 23 months the two batches tested provoked immunity at dilutions up to 1 : 20,000 (0·0001 g.). The fact that batch CK 12–3 provoked a reaction at 0·00005 g. and failed to do so at 0·0001 g. was probably due to the carry-over of a particle of tissue containing a quantity of virus during the dilution of the vaccine.

Lapinised Rinderpest Vaccine.—In all the six batches the 1 : 20,000 dilution (0·0001 g.) immunised the test cattle. The period of storage varied from 6 to 14½ months ; a comparison of Tables II and IV shows that there was no loss in titre over this period.

Discussion

It has been shown that these vaccines can be stored in the form of dried material for long periods without a serious loss of titre. This storage time is considerably greater than any other figures so far published for rinderpest virus vaccines.

The present technique, which enables the prolonged storage of vaccines, may prove indispensable in the event of an inter-territorial or international effort to eradicate rinderpest from Africa, when it is visualised that large stocks of vaccines would first be prepared and then distributed to key points some time before the start of a campaign. At present, stock-piling of vaccine has proved the answer to the irregular demand in East Africa.

Summary

Caprinised rinderpest vaccine (K.A.G.) was as fully potent as when first made after 11½ months' storage at — 4° to — 22° F. under the conditions described.

Lapinised rinderpest vaccine was fully potent after 14½ months under similar conditions of storage.

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(*Concluded at foot of col. 1, page 592*)

THE ZOOLOGICAL SOCIETY OF LONDON

The Zoological Society of London celebrated this year the Coronation of Her Majesty Queen Elizabeth II and also its own 125th anniversary. The events were marked by gay decorations and social events, chiefly the President's reception for distinguished guests of the Coronation and Fellows of the Society. In honour of Her Majesty a Coronation collection of special animals from all over the world was gathered together and especially labelled in gold lettering.

Her Majesty Queen Elizabeth II has been graciously pleased to continue the Royal association with this Society that dates back so very far, and has granted her patronage. "The Zoo" is immensely proud that since its inception in the early 19th century, the Royal Family has always taken an active part in its life—indeed, H.R.H. Prince Albert was President for 11 years. The present Queen, as a girl, was a constant visitor with her sister, Princess Margaret.

Sir Stamford Raffles was chairman of a meeting called in July, 1824, to discuss the formation of a Zoological Society. On the committee of the meeting of 20 distinguished men of Science and Letters sat such eminent gentlemen as the Duke of Somerset, the Earl of Darnley, the Earl of Egremont, the Earl of Malmesbury, the Bishop of Carlisle and Sir Humphrey Davy. The first sentence of the first paragraph of a prospectus circulated March 1st, 1825, headed "Zoological Society," commences: "For the general advancement of Zoological Science it is proposed . . . ." The immediate and continued scientific nature of the Society was thus established. After much assiduous work by Raffles and his co-workers, the Society received a Royal Charter.

During its life of 125 years the Society can claim to have added much to general zoological knowledge and to have had many famous names associated with it, such as those of Sir W. Flower, Sir E. Ray Lancaster, Sir Peter Chalmers-Mitchell, Mr. R. I. Pocock, Mr. Philip Lutley Sclater and Sir John Bland Sutton.

Various committees—Library, Prosectorial, Gardens, Finance, etc.—made up of members of Council, all voluntary supporters of high scientific knowledge and principles, maintain an efficient and critical standard of work. No effort is spared to keep the gardens and exhibition generally as large, attractive and decorative as possible from the public point of view, and as comprehensive as possible from the scientific point of view. Though the Society's main purpose still remains the advancement of Zoological Science, it is not forgotten that none would be possible without public support, since no Government or civic assistance is received.

Laboratories for zoological research exist, and a prosectorium records details of all *post-mortem* and anatomical examinations. The library is one of the most comprehensive of its type in the world, and publishes, *inter alia*, Proceedings and Transactions at regular intervals.

Veterinary interest in the Society commenced with Mr. Charles Spooner, of Cook's Row, Camden Town, in 1829. In 1833 Mr. William Youatt, of Wells Street, Oxford Street, was appointed "Medical Superintendent" at a salary of £100 per annum. He was to attend on Mondays and Thursdays, go round with the Head Keeper, inspect every animal, and give directions: he must also attend any emergency. Amongst other things, Youatt will be remembered as the founder and editor of *The Veterinarian*. Youatt died in 1847, aged 71, and no successor was appointed. It was at this stage that the close liaison between the Society and the Royal Veterinary College commenced. In 1909 Sewell and Cousens were appointed consulting veterinary surgeons, but had to relinquish their appointments in 1910 owing to pressure of work in their practices. Sir John M'Fadyean then arranged a system of co-operation, and Professors MacQueen and Wooldridge were appointed honorary consulting veterinary surgeons to the Society, with Mr. Ben Gorton—also on the staff of the Royal Veterinary College—as acting veterinary surgeon. Mr. Gorton attended daily until the middle of the 1914-18 war.

More recently, veterinary surgeons have received salaried appointments with the Society, culminating with the latest one where a double appointment was created—that of Curator of Mammals and Veterinary Officer. This is also a resident post, a flat being provided in the gardens.

Much interesting material is evolving from the application of modern veterinary methods and drugs to the care and attention of wild animals in captivity. Great help, as always, is received from the Royal Veterinary College, but also from the large drug houses. All realise that the problems posed are specialised ones, and full co-operation by everyone seems to be solving some of them.

In view of the increasing number of times a veterinary surgeon is called upon to treat a wild animal—a direct reflection of the increase in circuses, zoos and private pets—it is arguable that a short course of lectures might be well received in training schools.

O. G. J.

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Incidence of *C. bovis* Infestation in Dorset Cattle

The Western Gazette records that the Medical Officer for Dorset (Dr. A. A. Lisney) mentions in his annual report that the prevalence in recent years of *Cysticercus bovis* in cattle has been investigated, particularly in view of the risk of human infection. "That this increase is almost certainly due to the influx of displaced persons and prisoners during the war has been a matter of general agreement amongst research workers, but the eradication of this tape-worm presents a very difficult problem."

Mr. A. H. Parry, Assistant County Sanitary Officer, in a special article in the report, states that 91 cases were notified during 1952, as compared with 27 in 1950 and 56 in 1951. "With the co-operation of the meat inspectors of three slaughtering centres in Dorset, namely Poole, Dorchester and Upton, investigations were made into the possible cause for the increase in the number of cases of this hitherto comparatively rare affection of cattle in this country."

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Weekly Wisdom

Some further effort could and should be put into teaching teachers the technique of their craft. For who has not sat through inaudible and incomprehensible lectures; who has not been bewildered by an endless succession of lantern slides, or a breathless sequence of illegible formulae appearing momentarily in the top left-hand corner of the blackboard?—The Lancet.

CLINICAL COMMUNICATION

SPASTICITY IN THE BULL

A. W. VAUGHAN

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Subject.—A pure-bred, imported (English), five-year-old Holstein bull at the Government Dairy Farm.

History and Symptoms.—The first symptom noticed by the farm manager was disinclination on the part of the animal to move around, and a certain degree of difficulty in getting up. Examination revealed that the lameness was in both hind legs, although after a thorough examination it was found impossible to localise any area of tenderness. The animal was given a course of salicylates on the assumption that the condition was of rheumatic origin.

There was no improvement after an interval of three days when another examination was made. The symptoms were now more exaggerated and severe. There was great difficulty in rising and walking, and both actions were obviously accompanied by great pain. On forcing the animal to move, tremors occurred in the muscles of the front legs, and also the hind legs and quarters. This was followed by a backward extension of both hind legs. The bull would then hobble a few paces and refuse to move further. At this stage the temperature was elevated 2° F., the respiration blowing, and the pulse quick. It was still impossible to localise any definite area of pain or tenderness.

Treatment.—Over a period of three weeks, penicillin, vitamin B_1, narcotics, sulphonamides, rest and exercise were tried in turn without appreciable benefit. The animal became emaciated and could rise only with assistance, and then with great difficulty. Treatment, apart from the administration of narcotics and laxatives, was abandoned. The condition gradually improved over a period of two to three weeks, by which time the animal could move around without a great deal of discomfort. A course of arsenic injections and stomachics was given, and the general condition continued to improve. It was only after an interval of nearly three months, however, that the condition improved to such an extent that service could be resumed. Another attack of far less severity and shorter duration occurred the same year. Recovery was uneventful and followed on similar lines.

Discussion.—This condition has been reported in Germany, Norway and in the U.S.A. by Roberts (1953). There are few references to the disease, however, and none has been found in the standard text-books on veterinary medicine.

According to Roberts, it mainly affects bulls, and has most commonly been observed in Holsteins over four years of age. There appears to be a definite familial tendency. The cause is unknown, but apparently the condition is not an arthritis or peripheral nerve synapse lesion. It may possibly be a lesion in the central nervous system. Various lines of treatment have been tried without success.

This case is recorded in view of the almost complete lack of records of spasticity in the bull.

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ABSTRACTS

Influence of Copper on the Growth Rate of Cattle*

In 1949, on a once derelict reclaimed 3,700 acre area of fenland in West Suffolk, unthriftiness in Hereford and Hereford Cross-bred Shorthorn cattle was found to be due to copper deficiency. Classical symptoms occurred, and first appeared in calves 9 to 10 weeks of age. In copper deficient areas this is usual in beef herds, as calves are born from already copper deficient mothers in the spring, and subsequently run out at grass without supplementary copper. (Dairy calves, usually born in the autumn, receive copper in proprietary foods during their first winter and consequently show no symptoms until a year old.)

Experiments with cattle in the area showed (1) that providing spring calving, pregnant cows with copper prevented deficiency in their offspring during their first summer. The calves gained 2·2 lb. per day as compared with 1·5 lb. in the undosed controls; (2) the growth rate of cattle 12 to 30 months old approximated that of cattle in normal productive agricultural areas when copper was added to the diet. To obtain this result copper was supplied to yarded cattle during each winter. Summer grazing on deficient pasture depleted reserves built up during the previous winter.

The definition of marginal land is discussed. One reason for land entering into this category in the past could have been lowered productivity resulting from failure of animals to thrive. Since mineral deficiency could be a factor it is urged that causes of lowered productivity of derelict lands be investigated in the light of the experience gained in this particular area. Large areas of marginal land might thus come back into production.

C. M. E.

* **The Influence of Copper on the Growth Rate of Hereford and Cross-bred Hereford Cattle.** Field, H. I. (1953). *State Veterinary Journal.* **8**. 1-7. Abstracted from this privately circulated periodical by permission of the Editor.

* * * * *

Staining of Spermatozoa*

I.—Rao stresses the value of the negative staining of spermatozoa in routine morphological studies in artificial insemination work, based on its speed, simplicity, and the information it imparts. The process consists simply of rapidly mixing a drop of freshly collected semen with a drop or two of the stain of choice (5 per cent. nigrosin, indulin, aniline blue, methyl blue, china blue, trypan blue) on a clean microscopical slide and making smears from this semen-stain mixture. Only dead sperm appear to take up the stain, the number increasing with storage of semen. Such stained smears remain unaltered for at least 12 months.

II.—The author indicates the value of either Leishman's or Wright's stain for the study of sperm morphology. The process consists of staining air-dried smears of semen (one hour old) for one minute with a stock stain solution followed by dilution with an equal amount of distilled water, and permitting enough time for the diluted stain to

* **I.—Negative Staining of Spermatozoa; II.—Suitability of either Leishman's or Wright's Stain for the Study of Sperm Morphology; III.—Differential Staining of Live and Dead Spermatozoa.** Rao, C. K. (1953). *Indian Vet. J.* **29**. 303-309.

act. Such staining can be applied with success to cleared smears (saturated solution chlorazene half minute and washing).

III.—For the differential staining of living and dead sperms Rao tried numerous background and primary stains, finally selecting 2 per cent. solution of Congo red in M/8 phosphate buffer, 3 per cent. sodium citrate or 0·9 per cent. sodium chloride; these diluents in turn having been made up in doubly distilled water.

The method was as follows :—

The top of a clear glass rod is dipped in fresh semen. The semen thus adherent to the rod is mixed rapidly with a drop of the stain placed toward one end of a glass slide. Another clean slide is placed on top of the first one, the semen-stain mixture spreading between the two, any excess oozing at the edges being wiped off. The two slides are then quickly but gently separated and rapidly air-dried in a slanting position. The dried smears are dipped in 1 per cent. aqueous or alcholic HCL and dried without further washing. Preferably the wet freshly made smears can be subjected to the fumes of concentrated HCL. By this method of staining the living sperms remain unstained while the dead sperms take on a blue colour more marked at the tail and the post-nuclear cap. (The colour fades in a few hours, but can be restored by repeating the acid treatment.)

This is regarded as the simplest and most reliable differential stain.

W. T. R.

REVIEW

[The Pig Farmer's Veterinary Book: A Complete Guide to the Farm Treatment and Control of Pig Diseases. By Norman Barron, ph.d., m.r.c.v.s., Veterinary Lecturer at Reading University. (1952). Dairy Farmer (Books) Ltd., 10, Tavern Street, Ipswich. Price 12s. 6d.]

This book is one of a series produced by Dairy Farmer (Books) Ltd. which are intended to explain in fairly simple language the farm treatment of animals.

It is difficult for a veterinary surgeon to review a book of this kind, as his first reaction is almost bound to be unfavourable. The diagnosis of disease conditions and their treatment is a specialised study, and one feels that the layman will be unable to appreciate that the symptoms of a disease do not always run true to type.

On the other hand, if disease conditions are described in a readily understandable form, it seems probable that the farmer's suspicions of disease will be aroused at an early date and he will call in specialist advice to confirm his diagnosis.

In this book Dr. Barron has covered a wide field and discusses the housing and feeding of pigs in addition to the many disease conditions. The information is presented in a very readable form, and although opinions will vary on the degree of emphasis which should be given to individual subjects, Dr. Barron has wisely advised a visit by a veterinary surgeon where any doubt exists.

The photographs and drawings are good and the book should prove very useful to the pig farmer.

REPORT

SWAZILAND : ANNUAL REPORT (1952) OF THE DEPARTMENT OF VETERINARY SERVICES

The P.V.O. in his introduction states that two years have elapsed since the Veterinary and Dairy Divisions of the Livestock and Agricultural Department were combined and elevated to departmental status and, although much has been accomplished in the past, he stresses the need for future development of the livestock industry to contribute to the general prosperity of the Protectorate of Swaziland.

The report contains three useful maps of Swaziland, numerous appendices with statistics covering the last eight years in most cases, and is divided into four main parts, comprising a General Review, Reports on the Diseases of Livestock, Livestock Industry and Colonial Development and Welfare Scheme.

Diseases of Stock

Swaziland has experienced considerable success in the eradication or control of some of the major diseases which still confront many parts of Africa to-day. Foot-and-mouth disease due partly to rigid quarantines, also to good fortune, did not occur during the year. The position in regard to East Coast fever gave cause for considerable satisfaction on account of tick destruction and limitation of cattle movement. It is rightly pointed out that no false sense of security should be engendered and, to ensure greater efficiency and to limit the areas involved, more dipping units (tanks and baths) have been provided and supervision has been intensified. Diagnosis is made by examination of organ smears.

The favourable position in regard to trypanosomiasis reported previously has been maintained and no further evidence of the presence of the fly *G. pallidipes* having been found, active campaign measures were discontinued in July. A number of Harris traps are retained and regularly inspected at strategic points in danger zones. A small number of *G. austeni* continue to be taken in one area but there is no evidence of spread; the absence of a trained entomologist limits the study of this species of tsetse fly.

Anthrax is controlled by vaccinations and although enzootic, is thus prevented from becoming epizootic. Blackquarter, which is not a scheduled disease, would appear to take a far larger toll in spite of a cheap vaccine being available, but the demand by native stock owners remains poor. Rabies, although never diagnosed in Swaziland, remains a threat and a reduction in the extremely large number of dogs is indicated.

It is hoped to eradicate sheep scab by organised simultaneous dipping but difficulty is experienced through native owners failing to produce all small stock. Heartwater, of all the tick-borne diseases, still takes the heaviest toll in the middle and lower regions. In spite of practical difficulties in distributing the vaccine, over 5,000 calves were vaccinated.

All cattle were dipped at a seven-day interval except during the dry winter period of May to November. During the year 22 new cattle dipping tanks were built and two spraying units erected. Spraying as a method for cleansing cattle from ticks has so far not been satisfactory or economical and still must be regarded as in the experimental stage.

Increased use is being made by farmers of the various synthetic dipping materials in substitution for sodium arsenite and the results have been variable, due to the

absence of field tests and instability of these insecticides. On account of the resistance which *B. decoloratus* has developed to BHC and arsenical dips, the control of redwater and anaplasmosis (gall sickness) is not really efficient and immunity is therefore acquired by the local cattle. Introduced stock without immunity fortunately have the advantage of the use of various very effective curative drugs which prevent serious losses.

Chicken-pox and fowl typhoid cause a heavy mortality among unvaccinated birds. The danger of introducing Newcastle disease from the Union of South Africa is reduced by allowing only the importation of day-old chicks from certified farms.

Due to the dry conditions prevailing for the three previous years, cases of horse sickness have been fewer and milder; hence the number of vaccinations has dropped and it is feared that a heavy mortality rate may be experienced when climatic conditions become more favourable for the disease.

Taeniasis amongst Swazis is very common, hence measles in pigs is their most important disease, but effective control by public health measures is very difficult to achieve.

Livestock Industry

When benefits are experienced by stock owners, the control and eradication of stock diseases win their confidence more easily than attempts to change the customs and malpractices which are responsible for the destruction of their territory, by loss of soil fertility and by soil erosion. Over-stocking and over-cultivation in the comparatively healthy over-populated areas in the vicinity of permanent water supplies can be tackled only by dispersing the population, by the provision of water supplies over as many areas as possible, by boring or by surface catchment. Shifting cultivation, indiscriminate burning of grass and bush, wasteful tree destruction, bad methods of agriculture and animal husbandry are, as in so many other parts of Africa, responsible for land destruction and, with an ever-increasing human population, represent the chief causes of land hunger of which we hear so much in these days.

The Department is embarking on a long-term policy which aims at improving water supplies and so to disperse the livestock over the vast, thinly populated tracts of land. It is thought that with improved methods of farming, pasture improvement and by bush clearing, the livestock of Swaziland could actually be increased by 50 per cent.

A general improvement in the marketing of livestock and their products by the provision of sale yards, improvement in the preparation of hides and skins and other animal products, and an expansion in the dairy industry by the erection of more dairies are all taking place, but it is realised that progress will be slow. It is hoped to accelerate the process by propaganda and education. The Mpsisi Cattle Improvement Scheme has provided facilities for training European and Swazi personnel in improved methods of animal husbandry, in improving the natural pastures and in the conservation of water and fodder. The Nguni breed of cattle appears to be the most promising breed for ranching and draught due to its natural disease resistance and general hardiness, and indicates its use either pure or for grading with exotic breeds.

Exports of cattle, hides and butter from the territory brought in £500,000 during the year. With funds from Colonial Development and Welfare, the control of diseases by fencing along the eastern and northern borders, bush clearing with bulldozers to eradicate tsetse and improve pastures, erection of cream shelters and extension of motorable tracks and the carrying out of exploratory bore holes, are all valuable contributions to progress.

In conclusion, the P.V.O. pays tribute to the co-operation of other Government Departments, the European Advisory Council, the Executive Committees of Farmers' Associations and the efforts of all members of his Department for the progress already achieved.

H. H.-B.

NOTES AND NEWS

Diary of Events

Sept. 18th.—Meeting of the Biochemical Society at Leeds (Department of Biochemistry, The School of Medicine), 11 a.m.

Sept. 18th.—Quarterly Meeting of the South Wales Division, B.V.A., at the Royal Gate House Hotel, Tenby, 2 p.m.

Sept. 23rd.—Meeting of the Supplementary Veterinary Register Division, B.V.A., at the Wellcome Foundation Building, 183-193, Euston Road, London, N.W.1, 1.45 p.m.

Sept. 25th.—Annual General Meeting of the Veterinary Section of UFAW, at Westham House, Barford, Warwick, 2 p.m.

Sept. 25th.—Meeting of the R.A.V.C. Division, B.V.A., at Melton Mowbray, 11.30 a.m.

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The British Veterinary Association at Aberdeen

It is a far cry from the island loveliness of Stockholm to the fine granite city of Aberdeen, but pleasant to think that our representatives at the recent "International"—the President, Mr. A. M. Graham, and the Senior Vice-President, Mr. A. J. Wright—are now, as we write, sharing with the other officers of the British Veterinary Association the enjoyable duty of leading to success the proceedings of the 71st Congress, so carefully shepherded in that direction by our enthusiastic Provisional Committee, under its President, Mr. W. J. B. Robson, and its Hon. Local Secretary, Dr. Alastair Greig. On Saturday last the large party that journeyed comfortably enough by rail from London was joined at its destination by those who travelled similarly, or by plane or car, as massive reinforcements of the advance guard, who, during the past week, have revelled in the stalwart achievements of participants in the famous "Braemar Gathering," at which are featured the famous national sports of Scotland. Eventually, all but the dilatory, or late-comers genuinely to be excused, found their way on Sunday to the Caledonian Hotel, to savour the pleasures afforded by the "At Home" held by the host Division, the North of Scotland, to welcome the incoming members and their ladies. In due course we shall recount the long and honourable history of this sturdy, long-established constituent of the great group of veterinary societies now affiliated to the B.V.A.; at the moment we can but gratefully record that its members welcomed the Association right royally and, by wearing a ribbon of Gordon tartan as a background to the Congress badge, enabled their guests to get to know the "Northern Scots" and indeed to feel at home among them from the outset.

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Aberdeen has sustained many changes since our previous visit here as a Congress-holding body in 1924. The Palace Hotel—then the Association's Headquarters—is no more and if on this occasion we are unable to meet in the dignified environment of the University buildings, we are grateful for the convenience and comfort of the com-

modious Music Hall group in Union Street. Here, under one roof, members and visitors assemble alike to attend the sessions, visit the Exhibition, besiege the Secretary's office and enjoy the sociability of it all. Overseas visitors are numerous and in this respect at least we are glad to be able to record an impression of a distinct improvement on last year's gathering. We were greeted with perfect weather and we joyfully heard promise of its indefinite continuance. Many found their way to the esplanade, with its fine sands and shining sea, on a Sunday afternoon of such quality that even the President, despite his native knowledge, was heard making hopeful enquiry as to the possibility of hiring a bathing costume on that particular day!

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Perhaps it was somewhat surprising to find far Aberdeen vieing with our most recent venues, Harrogate and Eastbourne, as being among Britain's most popular Conference centres, but the fact that it has established its claims so successfully cannot be dissociated from the welcoming and co-operative attitude of its civic authorities. An early manifestation came from the Lord Provost on Monday morning, when the Reverend Professor John M. Graham, M.A., accorded the Association a delightful welcome for this conference " under the Chairmanship of a fellow clansman." At the equally impressive complementary ceremony which followed, Lady Tweedsmuir, M.P., officially opened the Conference, introduced by the President as " one of the outstanding personalities of the House of Commons." This admirable innovation was most knowledgeably launched, the speaker taking as her theme the importance of the veterinary profession in the life of the community. Speaking of its rôle in the provision of clean and safe foods of animal origin, she made the topical point that the inspection of home-killed meat should be under the control of veterinary surgeons, who are specially fitted to supervise this operation by reason of their professional knowledge. Tribute was paid to the work of the profession, particularly in Scotland, in pressing on with schemes to ensure to the housewife and to schools the supply of non-infected milk. There followed a graceful reference to the disease averting or controlling efforts of the Animal Health Division—the President's own sphere—this being succeeded by another happy touch: the work put in by the R.A.V.C. in training horses for the Coronation. Lady Tweedsmuir sustained to the end the gratification afforded by her address, for in a notable passage on small-animal practice she referred to the long-standing tradition of the profession, that no animal is ever turned away because the owner can afford nothing for its treatment. There followed an enthusiastic welcome for the delegates from overseas and all representatives from home local authorities and Government departments.

At this stage official acknowledgment was given that the Congress was so well attended that there were insufficient tickets to meet the demands of all the would-be participants in social functions.

In the evening came a renewal of civic greetings, with traditional hospitality, at the reception and dance given in the splendid Beach Ballroom by the Lord Provost and Corporation.

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Meanwhile, the more serious business of the week had got steadily under way. A most attractive—and helpful—exhibition of the "tools" of the modern veterinary surgeon had been commended by the President to the interest of the members before, at noon on Monday, they re-assembled to see three short films on small-animal surgery by Dr. J. S. A. Spreull, of Dundee. These films depicted with excellent surgical and photographic technique (i) "Excision of anal sacs under the spinal nerve block" (ii) "Aural resection in the dog" (iii) "Excision of meniscus." Amongst other film attractions of the Congress were those shown by Mr. D. D. Ogilvie on Tuesday. The first recounted the story of the recent developments of the veterinary services in Egypt. The other, also an Imperial Chemical (Pharmaceuticals) production, demonstrated the factors responsible for the secretion of the gastric juice. On Monday afternoon a crowded audience heard Dr. A. W. Stableforth introduce his paper succinctly describing the research activities represented by "Recent Advances at Weybridge"; this constituted a salutary reminder of the wide range and importance of the work being carried on by the Ministry at its principal centre, so much of which has a direct bearing on current practice. Needless to say, this paved the way to a comprehensive discussion, which, under the able leadership of Mr. D. L. Hughes, of Thurgarton, both provided and elicited further valuable information. The same remarks apply to the discussion, on the following morning, introduced by Mr. D. F. Oliver, of Grantham, and Dr. David Luke, of Stormont, on the paper by Mr. D. S. Soutar, of the North of Scotland College of Agriculture, on the theme of pig housing in relation to health. This was helpfully supplemented by the demonstration arranged by Mr. Soutar for the afternoon, when a large company participated in the visit to Craibstone Farm and other places where enterprising farmers in the North of Scotland have enlisted the co-operation of the College of Agriculture in designing these structures. Both these papers and the demonstration exemplified the stress laid throughout the scientific programme on the profession's impressive contribution towards, and responsibility for, the vital task of increasing the nation's supply of home-grown food. It may be mentioned that for all but the earliest discussions the sessions were strengthened by the presence of those eminent members who had had the distinction of presenting papers to the British Association at Liverpool at the beginning of the week.

Meantime, the ladies had spent Tuesday afternoon in a well-patronised and thoroughly enjoyable excursion to Paradise Woods and Alford, after having—as we may hope and expect—adequately supported the antecedent annual general meeting of that fine and most helpful institution, the Ladies' Guild branch of the V.V.B.F.

(*To be continued*)

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SOCIAL MEDICINE ON THE FARM

Pioneer Work by Veterinarians

In its issue of Saturday last *The Times* printed, under the above headings, the following eve of Congress contribution from a correspondent:—

The 71st annual Congress of the British Veterinary Association, which opens in Aberdeen on Monday, will be the occasion for a review of the recent achievements of veterinary medicine and science. Its discoveries lead directly to advances in the investigation of human disease, and there is more similarity between certain conditions in animals and in man than medical science has previously observed.

One example is *Bacterium coli*, which causes intestinal disorders of the young. Veterinary science has known for upwards of half a century that this organism, although present in normal animals, is capable of killing calves. It is only recently that the similarity of a form of diarrhoea in human infants, which may be fatal, has been recognised. This may affect, profoundly, the outlook of paediatricians.

The association between cow pox and smallpox, and the practice of vaccination initiated by Jenner in 1796, are well known. The researches of Pasteur on the immunisation of animals and birds against anthrax and fowl cholera is another example. These studies led directly to immunisation against several human diseases. The story of viruses and the diseases in man and animals to which they give rise is based on original discoveries by veter-

inarians. The pioneer work of Ivanovski on tobacco mosaic and that of Loeffler and Frosch on foot-and-mouth disease are examples.

Human influenza has proved, so far, a difficult problem. Ferrets were used for the isolation of the type A virus by Laidlaw and his colleagues because of the success of Laidlaw and Dunkin with canine distemper. It remains to be seen whether the observations of Shope concerning the virus of swine influenza have a bearing on influenza epidemics in man.

Men with a primarily veterinary training have occasionally contributed directly to the solution of medical problems. Feldman, a veterinary surgeon, is a world authority on tuberculosis; Llewellyn Bevan showed that human beings suffered from infection with *Brucella abortus*, and Ramon has contributed largely to our understanding and control of human diphtheria. Penicillin is a major medical discovery, but nevertheless the link between the work of Fleming and the team led by Florey was provided by two chemists and a veterinary surgeon.

Much has been heard about social medicine. This is the positive and constructive outlook whose aim is to ensure the control of disease by preventive methods on a group basis. Among the human population it is as yet in its infancy, but on the farm it is accepted practice. The Attested Herd Scheme has played a great part in improving the health and productivity of dairy cattle, as well as providing safeguards against the spread of tuberculosis of bovine type to human beings. The vaccination scheme against contagious abortion has reduced enormously the losses due to *Brucella* infection. A national pig vaccination scheme against swine fever is to be introduced, following discussions between the Ministry of Agriculture, the National Farmers' Union and the British Veterinary Association. Social medicine on the farm includes the application of the principles of genetics and of the science of nutrition, and this outlook is accepted by modern veterinarians as the natural order of things.

Several of the papers to be given at the Congress reflect the veterinary interest in this subject. One deals with pig housing and its relation to health, and on the same afternoon there is a demonstration of modern methods. The spectacular increase in pig numbers lately has been more than equalled by the increase in knowledge of the clinical diseases and social medicine of this animal.

The value of social medicine to man is unfortunately lessened by the official refusal, to date, to place meat inspection in the charge of the veterinary profession. The training and experience of veterinary surgeons make them the obvious, and indeed the only, fit persons to control the inspection of meat, and England is one of the few Western nations where this is not the general practice.

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THE BRITISH ASSOCIATION AT LIVERPOOL

Veterinary Preventive Medicine

As with the B.V.A. at Aberdeen, nearly 30 years have passed since the British Association for the Advancement of Science last assembled at Liverpool. On September 2nd, however, the University again joined with the city to welcome the return of members for the 115th meeting of the Association. Whereas in those early days relatively little attention was paid to agriculture and none whatever to veterinary science, the former now has a section, and on Monday last the proceedings centred largely round the subject of preventive medicine for farm livestock. We hope to print a special report in our next issue of the sessions at which the discussion was opened by Dr. E. G. White, Professor of Veterinary Preventive Medicine in the University of Liverpool. Other speakers were Mr. J. N. Ritchie, Chief Veterinary Officer of the Ministry of Agriculture in Edinburgh ("The State's Part in Controlling Disease"), Mr. J. O. L. King, Senior Lecturer in Animal Husbandry at Liverpool University (bad management and housing as causative factors in disease amongst animals), and Dr. E. L. Taylor, Deputy Director of the Ministry Veterinary Laboratory at Weybridge (influence of parasitic diseases on animal production).

It is intended that our summarised report shall cover also other sections in which members of the profession are participating or which are of special interest to veterinarians.

Among the scheduled excursions is a visit to the Liverpool University Veterinary Field Station on the Wirral.

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Animal Physiological Study as Essential Basis of Livestock Improvement

In his presidential address to the agriculture section, Dr. J. Hammond, F.R.S., of Cambridge, described some of the ways in which animal physiology could be applied to the problems of animal production. He referred to a number of problems in which active research was now in progress.

Animal physiology, said Dr. Hammond, provided an essential basis for livestock improvement and genetic selection, in that it showed what the factors limiting production were and how they might be overcome. For example, in many of our well-bred and well-fed cows to-day the limit of production was imposed by milk pressure in the udder, which could be overcome either by more frequent milking or by the selection of cows with more elastic udders. Again, although much genetic improvement for milk production in this country had been made, when British dairy cattle were taken to the tropics they were found to give far less milk even though they were adequately fed. It was because their body temperature regulating powers were inefficient in air temperatures above about 75° F., and that character had to be added to our breeds before they became efficient under tropical conditions. Work was now in progress to determine exactly how the power of heat tolerance was obtained in breeds natural to the tropics.

Raising Animal Output

The physiology of body temperature regulation also had important agricultural applications in this climate, said Dr. Hammond; for instance, it had been estimated that under our winter temperatures it required about one hundredweight more meal to produce a bacon pig than when temperature conditions were optimal. Environmental conditions affected the productivity of animals, and the means by which they adjusted themselves to various conditions offered much scope for profitable study. Much work had already been done on the physiology of nutrition, but there was still much more to unravel. Of particular interest at the present time was the way in which vegetable proteins were converted into animal proteins, in view of the shortage of the latter available as feeding-stuffs. In that process the importance of vitamin B_{12} was evident, and because cobalt was an essential element in B_{12} ruminants were particularly susceptible to its deficiency in feeding-stuffs. However, recent work on antibiotics seemed to indicate that they could act as a supplement and substitute for vitamin B_{12} and so would form a welcome addition to supplies of B_{12} and animal proteins. It might be found that the growth hormone of the anterior pituitary which encouraged the retention of proteins by the body was associated with that.

Experiments with hormones, in causing many eggs to ripen instead of one or two, had shed light on old problems and opened the way to completely new developments in animal husbandry. The ovary of the newborn calf contained about 70,000 eggs, said the President, but rarely did even the best cows produce more than 10 calves in a lifetime. By superovulation and transplantation of the excess eggs into other females to incubate, it should therefore be possible to increase the reproduction rate of genetically superior cows as artificial insemination had done for bulls.

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Veterinary Surgeons and National Service

As was intimated in our last issue, enquiries are being received at Association Headquarters as to what is being done to take up with the appropriate authorities cases of hardship arising from the operation of the new regulations whereby veterinary students completing their normal course of studies during 1953 will be available for call-up.

Attention is again drawn to the fact that, as was intimated in our summary of the proceedings of the July meeting of Council (*Vet. Rec.* **65.** 524), the Royal College of Veterinary Surgeons have written to the Ministry of Agriculture suggesting that a liaison committee should be set up, on similar lines to the committees operating for the medical and dental professions, to consider cases of genuine hardship; and have also suggested that the age of deferment (at present 26) be extended to 30, so that young men who had some particular job on hand could complete it before doing their national service.

These representations have had the full support of the Association and we would stress that, whether or not the proposed liaison committee is set up, all possible information relating to cases of hardship should be sent in to 36, Gordon Square, in order that the Association may be in

a position to present it to the committee, or to make approaches elsewhere, as is in fact being done now, whenever a useful opportunity presents itself.

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The Harry Steele-Bodger Memorial

At meetings during Congress week in Aberdeen it was announced that the sum of £3,467 5s. 5d. was collected for the Memorial to the late Harry Steele-Bodger. After covering expenses incurred by the appeal the sum of £3,369 0s. 3d. has been invested in Trustee Securities, the interest of which, amounting to approximately £135 per annum, will be used to provide travelling scholarships for veterinary surgeons.

It is hoped that the first award will be made in 1954 and announcements regarding this and the method of application will be made early in the New Year.

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PERSONAL

Births.—Bouvet.—On July 14th, 1953, at Curepipe, Mauritius, to Honor (*née* Barratt) and Roger Bouvet, M.R.C.V.S., a son—Jean-Pierre.

Wilson.—On August 23rd, 1953, at Fort Victoria, Southern Rhodesia, to Doreen, wife of Alex Wilson, M.R.C.V.S., a daughter—Sheena Margaret.

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Appointment.—Miss O. Uvarov, M.R.C.V.S., recently joined the technical staff of the Veterinary Department of Glaxo Laboratories Ltd., as assistant to Mr. Neil Mathieson, M.R.C.V.S.

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Colonial Veterinary Service.—The following notification appears in the August, 1953, list of appointments:—

"Amendment: O'Moore, L. B., Chief Veterinary Research Officer, Northern Rhodesia—Offer declined: see July list."

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Ministry's Veterinary Field Staff.—Captain W. L. Sheffield, M.R.C.V.S., Superintending Veterinary Officer at Quorn, retired on September 9th, 1953.

Mr. J. A. Graham, M.R.C.V.S., Divisional Veterinary Officer, was transferred from Glasgow Quarantine Station to Hamilton, and Mr. H. McEnhill, M.R.C.V.S., was transferred from Leeds to Glasgow Quarantine Station on September 10th, 1953, on promotion as D.V.O. in charge.

Mr. E. G. Morris, M.R.C.V.S., at present Divisional Veterinary Officer at Winchester, took up his station as Superintending Veterinary Officer in charge of Peterborough, Rutland and Huntingdonshire, Leicestershire, Northamptonshire and Warwickshire on September 10th, 1953.

Mr. J. Maffey, M.R.C.V.S., Research Officer, was transferred from the Veterinary Laboratory, Weybridge, to the Veterinary Investigation Centre, Langford, Bristol, on September 1st, 1953, as Assistant Veterinary Investigation Officer.

Mr. D. R. Melrose, B.Sc., M.R.C.V.S., Veterinary Investigation Officer stationed at Reading Cattle Breeding Centre, Shinfield, has been seconded to the Colonial Office as from September 1st, 1953.

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R.C.V.S. OBITUARY

The Late Mr. R. M. Davidson, B.Sc., M.R.C.V.S.

In recent issues we have notified, with much regret, the death of Mr. Robert Mackay Davidson, Divisional Veterinary Officer of the Ministry of Agriculture, who passed away in a Lanarkshire hospital on August 16th, and of whom an appreciation appeared in these columns last week.

Mr. Davidson was educated at Inverness Royal Academy and went to Edinburgh University and the Royal (Dick) Veterinary College, graduating B.Sc. (Vet.) and gaining his M.R.C.V.S. qualification. Mr. Davidson gained honours in bacteriology, pathology, interior medica and hygiene for his M.R.C.V.S., and after acting as *locum tenens* in various parts of the country, he went to Croydon where he bought his own practice. From there he went to Banffshire.

Mr. Davidson was the first County Veterinary Officer for Banffshire. He was appointed to his Banffshire post in August, 1930, and served for four years in the county, where he was held in high esteem by the farming community generally. From Banffshire he was appointed Chief Veterinary Officer for Berkshire.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

Ches.—Haymoor Green Farm, Stapeley, Nantwich (Sept. 3).

Lancs.—Lower Barnsfold Farm, Goosnargh, Preston (Sept. 1).

Norfolk.—Southery Road Farm, Feltwell Road, Southery, Downham Market (Sept. 3).

Salop.—Church Farm, Rowton, Wellington (Sept. 2).

Fowl Pest:

Lincs.—32, Church Green Road, and Wythes Lane, Fishtoft, Boston (Sept. 3).

Swine Fever:

Beds.—Park Farm, Bletsoe, Bedford (Sept. 4).

Cambs.—Williamsons Yard, High Street, Swavesey; Whitehall Farm, Croxton (Sept. 2); Manor Farm, Feversham (Sept. 4).

Ches.—Mickley Hall Farm, Broomhall, Nantwich (Sept. 1).

Cornwall.—Penpont, Altarnum, Launceston (Sept. 4).

Essex.—Mount Lodge, Great Totham, Maldon; Ongar Hall, Brentwood Road, Orsett, Grays (Sept. 1); Elmstead Lodge, Elmstead, Colchester (Sept. 4).

Gloucs.—Cross House Inn, Doynton, Bristol (Sept. 3).

Hunts.—Waterloo Farm, Eynesbury, Huntingdon (Sept. 1); Houghton Hill House, Houghton (Sept. 2).

Isle of Ely.—1, Primrose Hill, Doddington, March (Sept. 2).

Lancs.—Crostons Farm, Whittle-le-Woods, Chorley (Sept. 4).

Norfolk.—Old Garden Piggeries, Whittington, Northwold, Thetford (Sept. 1); Arabic House, Chapel Lane, West Dereham, King's Lynn; Priory Farm, Aldeby, Beccles (Sept. 2); The Fox Inn, Hevingham (Sept. 4).

Salop.—Rose Cottage, Bridgnorth (Sept. 4).

Staffs.—Peaks Farm, Onneley, Madeley, Newcastle (Sept. 3).

Surrey.—Council Allotments, Old Claygate Lane, Thames Ditton (Sept. 4).

Sussex.—Vinetrow Farm, Northmundham, Chichester (Sept. 1).

Warwicks.—Bates Yard, New Meeting Street, Oldbury, Birmingham (Sept. 4).

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PHARMACY AND POISONS ACT, 1933

The Home Office draws attention to the Poisons List Order, 1953 (S.I. 1953 No. 1300) and the Poisons Rules, 1953 (S.I. 1953 No. 1301) which were made by the Secretary of State on August 20th, 1953, laid before Parliament on August 24th, 1953, and came in operation on September 1st, 1953.

These Statutory Instruments give effect to the Poisons Board's recommendations to the Secretary of State which are detailed in Home Office Notice dated July 13th, 1953.•

Copies of the Poisons List Order, 1953 (price 4d. net) and of the Poisons Rules, 1953 (price 3d. net) may be obtained from Her Majesty's Stationery Office.

• See *Vet. Rec.* **65.** 506.

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VETERINARY RESEARCH INSTITUTE, MALAYA

Commonwealth Survey (July 31st, 1953) reports that the new Veterinary Research Institute at Ipoh was opened by Sir Gerald Templer, the High Commissioner for the Federation of Malaya, in June, 1953. Designed to serve both the Federation and Singapore, the Institute was built and equipped at a cost of $M900,000[1] provided mainly from the United Kingdom Colonial Development and Welfare vote. The 33-acre site was given by the Government of Perak State.

Up to the second world war the work of the Veterinary Department was mainly in the field, laboratory work being restricted to the preparation of vaccines. During this period the greatest single achievement was the elimination of rinderpest.

Since the war the veterinary staff have expanded both field and research work to tackle the serious decline in livestock numbers and the deterioration of animal health resulting from the occupation years.

Temporary laboratories were converted for the investigation of animal disease and the increased production of vaccines. The campaign against the dreaded disease of poultry, ranikhet, which killed tens of thousands of birds a year, was launched in 1947. Using vaccines prepared locally, the veterinary staff have carried out a widespread inoculation scheme. The success of this campaign has been the chief factor in restoring confidence in poultry-keeping and in increasing production. Despite the limited laboratory facilities, the Veterinary Department has produced over 17,000,000 doses of poultry vaccine, sufficient for the needs of

[1] One Malayan dollar=2s. 4d.

the Federation and Singapore and for dispatch to Hong Kong, the North Borneo dependencies and other South-East Asia countries.

The extensive facilities for research provided at the new Institute are planned not only to assure the prosperity of Malaya's livestock industry but also to make available more scientific knowledge and material assistance to neighbouring territories which share Malaya's livestock problems.

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COMMERCIAL SOLVENTS AWARD IN ANTIBIOTICS

Drs. Ibert C. Wells (Syracuse, N.Y.), Edwin E. Hays (Chicago, Ill.), E. A. Doisy (St. Louis, Minn.) and William L. Gaby (Philadelphia, Pa.) have been awarded the 1952 Commercial Solvents Award in Antibiotics for work on antibiotics from *Pseudomonas aeruginosa*. These workers have demonstrated that, in addition to pyocyanine, *P. aeruginosa* produces several other antibacterial agents; they have worked out methods of isolation, separation and purification of these agents, defined their physical and chemical properties, proposed structural formulae for them and, by degradation and synthesis, proved the acceptability of the proposed formulae. The Commercial Solvents Antibiotics Award was established in 1950 and is administered by the Society of American Bacteriologists. It consists of a gold medal and 1,000 dollars, and is awarded to any person or group of persons working in the western hemisphere who have made an outstanding contribution in the field of antibiotics during the past year.—*Nature*.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

VIRUS PNEUMONIA IN PIGS

Sir,—In an annotation on virus pneumonia of pigs (*Vet. Rec.* (1952.) **64.** 442-444) reference was made to a system of control which has been found successful in Northern Ireland. We are receiving numerous enquiries regarding this method and even from Canada, where it is thought that a modification of it would help to control rhinitis in swine. Briefly, the system is as follows: Only sows free from any evidence of coughing are kept and these are allowed on pasture with self-feeding meal hoppers until they are due to farrow. They are then moved into individual farrowing pens and when observed making a bed in the straw they are moved into a farrowing crate as described in the British Veterinary Association handbook on Diseases of Pigs, with this modification—infra-red lamps are fitted to the farrowing crate so that the piglets are born into a temperature of 70° to 75°. Each farrowing crate is maintained in its own house and is scrubbed and disinfected after each sow has used it. The sow and her litter are kept in the farrowing crate for from two to three days. Incidentally, the fitting of the infra-red lamps is a great improvement and has reduced infant pig mortality to vanishing point.

At the end of two to three days the sow and piglets are moved to a double-walled hut on pasture. The sows and litters remain on pasture for four to five weeks; by this time the owner or his herdsman will have detected any sign of sneezing or coughing in the piglets, and if the litter is free it is moved along with the sow to the rearing house, where similar warm surroundings are provided. If a litter is observed coughing, that sow and litter are discarded as it is assumed that the sow is a chronic carrier of virus. Weaning is carried out at eight weeks and after weaning the store pigs are moved to a comfortable fattening house. No pigs from a coughing litter are allowed into the rearing or fattening house, although they may not all have been observed coughing. The entire litter is considered as being infected.

This method has proved simple and effective in practice.—Yours faithfully, H. G. Lamont, D. Luke, W. A. M. Gordon, Ministry of Agriculture for Northern Ireland, Veterinary Research Division, The Farm, Stormont, Belfast. *September 2nd*, 1953.

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NOTES ON THE USE OF "PENOTRANE" IN GENERAL PRACTICE

Sir,—About two years ago I contributed an article to *The Veterinary Record* describing the use of phenylmercuric dinaphthylmethane disulphonate ("Penotrane") in the treatment of bovine metritis. In my subsequent experience this treatment has continued to give very satisfactory results, and I have been interested in using the solution for other conditions encountered in practice.

I do not think that the data I have available warrant an orthodox Clinical Communication, but it has occurred to me that the following notes on treatments with Penotrane solution may be of interest to your readers:—

1. *Foul in the Foot in Cattle.*—Recently I attended a Friesian cow which was dead lame on the left foreleg owing to a long-standing and neglected "foul in the foot." Both digits were swollen—the outer one the more—and very painful. A quittor-like sinus was discharging pus just above the coronary band on the outer side of the foot, and a second sinus was discharging downward between the digits, just to the outer side of the mid-line. The cow was treated with sulphamezathine solution intravenously and twice daily foot baths of warm hypertonic saline. Five days later the cow was still dead lame and carrying the limb. The foot showed no change, except for the fact that the pus was somewhat more fluid. The sulphamezathine injection was repeated and a course of the same drug was given by mouth for four days. The foot baths were continued. At the next examination, five days later, the condition was unchanged, and a third sinus had appeared farther forward above the coronary band.

The cow was cast and, by means of a teat siphon attached to a Higginson's enema syringe, about 8 oz. of aqueous Penotrane, 0·1 per cent. solution, was injected deep into the larger sinus above the coronet. The solution was pumped slowly into the sinus, and after a few seconds began to run out through the other two orifices, bringing quantities of thick pus with it. Five days later the cow was seen again and showed a marked improvement; the swelling had obviously subsided and the foot was taking a little weight. The irrigation with Penotrane was repeated, the solution running freely through the fistulae, bringing some thin pus with it, but nothing like the quantity observed on the first occasion. A week later the cow was walking on the foot, though still lame, and the treatment was repeated. This time the smaller sinus above the coronet had closed up, and it was with some difficulty that the teat siphon was introduced into the other upper orifice, as this was rapidly closing with granulations. With the application of more pressure on the enema syringe, the solution ran out almost clean from the lower opening between the digits. The foot was now nearly of normal size and the cow showed no pain on digital pressure to the affected part.

A fortnight later the cow was walking sound; all the fistulae had closed completely and the foot was almost normal except for some thickening around the coronary band.

This case could have been classed as one which merited amputation of the affected digit, but this course was not necessary with the treatment described.

I treated a similar case in the same manner some weeks previously. This was not so badly affected and only one sinus had developed. Recovery followed after three irrigations with Penotrane.

2. *Thrush in the Foot of a Horse.*—The subject was an aged cart-horse which had had thrush in the off-hind foot for some months without much inconvenience. Latterly, the condition became worse; the horse was walking lame and standing with the affected limb flexed when at rest.

Examination revealed a well-developed foul-smelling thrush affecting both the central and lateral lacunae of the frog and extending as a moist eczema on to the bulbs of the heel. Bearing in mind the properties of Penotrane, I decided to try treatment with this, rather than any of the old accepted methods.

The owner was advised to cleanse the affected part once daily with Octaphen solution (a quaternary ammonium compound with detergent and bactericidal properties) and after swabbing dry to apply Penotrane solution, 0·1 per cent., on a swab of cotton wool with slight friction, to the affected area. After five days the foot was much improved; the smell had gone and the discharge diminished. The horse was less lame. The preliminary washing with Octaphen was discontinued; but the once daily applications of Penotrane solution were maintained.

A week later the horse was walking sound, the bulbs of the heel were healthy, and the thrush had cleared up except for a moist patch in the central lacuna of the frog. The applications of Penotrane solution were stopped and treatment continued with tincture of Penotrane applied once daily to the moist patch and to the whole area which had been affected. The horse was put back to work. I saw it a week later and found that it was working regularly, walking quite sound and the foot quite healthy.

3. *Purulent Otitis Externa in the Dog.*—I have treated numerous cases of this condition with Penotrane solution, which has cleared them up in a very short time compared with other treatments. I have found that the best way to apply the solution is by means of a length of No. 4 polythene drainage tubing, attached to the nozzle of a 20 c.c. Record syringe. After wiping away excess pus from the ear, the pliable tubing is inserted as far as possible into the auditory canal and the syringeful of solu-

tion injected with some pressure to flush out the ear. The residue of the solution is left in the ear without further swabbing. Treatment is repeated in three days and most cases have cleared up after two or three irrigations. Once the discharge has ceased a final treatment has been to introduce a little Penotrane cream into the ear, which is gently massaged and excess cream wiped away.

The results described above are in accord with the pharmacological properties of Penotrane, *i.e.*, potent bactericidal and fungicidal action, not impaired by pus or tissue débris; powers of penetrating living epidermis, dermis and subjacent tissues and an ability to build up tissue concentration through being absorbed on tissue protein.—Yours faithfully, F. G. Waddington, "Limuru," Thetford Road, Watton, Norfolk. *August 23rd*, 1953.

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THE TOXIC TOAD

Sir,—Countless numbers of people go through life ignoring the obvious, and so far as the toxic toad is concerned I certainly am one of them. But perhaps there is some excuse for me as poisoning in the dog from contact with a toad was so very common in Central India when I was there that one took very little notice of it. It certainly never occurred to me that the condition had not been recorded.

The symptoms, nothing like so pronounced as those described by Mr. R. H. Smythe in his communication (*The Veterinary Record*, No. 30, dated July 25th, 1953), were chiefly those of salivation, with occasional vomiting of a mild nature, and that was about all. Fifteen to twenty minutes after the onset most cases had recovered completely. But the animal did not forget the incident as I cannot remember ever having seen the condition again in the same dog. Immunity? No; he had learned the lesson to leave such things as frogs and toads severely alone.

The trouble, one might say, always occurred at the beginning of or during the rainy season about dusk when toads came out of their daytime hiding places in search of mosquitoes and other delicacies. Dogs a few months old (whelped during the dry season) which had never seen a toad or a frog were the chief sufferers. Turned out into the garden just before dark for a final run round, they would come back into the bungalow dribbling at the mouth and looking the picture of misery. When this happened to one of my own dogs I would remark to my wife, or she to me, "He has been busy with a frog." No treatment was required and a little later the dog had got over it. But quite often frantic messages were received from other dog owners who had never before seen the condition, to the effect that their dog had rabies, had been bitten by a snake, or had been poisoned. Thanks to Mr. Smythe, we now know that it had been poisoned, though not in the ordinary way, and he must be congratulated for not only throwing light on the matter but also in supplying it with a name. For what could be neater or more descriptive than "The Toxic Toad"?—Yours faithfully, G. K. Shaw, Sundale, Hilton Road, Natal, South Africa. *August 24th*, 1953.

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RECENT DEVELOPMENTS IN VETERINARY PRACTICE

Sir,—I venture to think the profession owes a debt of gratitude to Dr. W. R. Wooldridge for his masterly survey on the above subject which appeared in your issue of August 8th, 1953. He has covered a large and comprehensive field, bringing home to the reader the great truth that the forward strides during the last two or three decades have been enormous: most of them to the common good—a few not so.

Looking along the vista of years since I qualified and went into the world as a general practitioner, my "Bible" and companion was Finlay Dunn's "Action and Uses of Veterinary Medicine" and his descriptions, so I thought, were at once so accurate and convincing that one had only to diagnose the case correctly and the key to successful prescribing was to be found within its pages. Before many years had elapsed, however, I began to realise that drug therapy had its limitations and that it was not the "alpha and omega" in the battle against disease.

Therapeutics, like many other things in this life, is largely a child of fashion; a certain drug is lauded sky high to-day and breaks upon the horizon with a great flourish of trumpets. It runs its course and having been weighed in the balance and found wanting, is cast into the limbo of the past. It does not follow, however, that all is waste, for its failure to fulfil hopes and desires may turn out to be a stepping stone to higher things.

To-day we find ourselves in the antibiotic synthetic age, the mould *cum* sulpha groups being in the vanguard, and I often wonder if we are not "going the pace" too fast in so far as these potent agents are concerned. All through my professional life I have studied "The *Vis Medicatrix Naturae*" and I have not been let down, for I know that, day and night behind the scenes, Nature is assiduously working, with cunning skill, to heal the breach and complete the repair. Man, in his arrogance and vanity, when he pulls off a case exclaims, "see what I have done and see what I can do," while in very truth Nature does the work and man takes the credit. This means, follow Nature and she will be ever helpful; work against her and ultimately she will have her revenge—poison her by complex drugs and she will have her day of reckoning.

I am not depreciating the activities of the research workers, who are doing a fine job, but I do suggest that any new discovery should be tested in season and out of season before it is passed on to the general practitioner, and that those agents which have passed the acid test should be used with *moderation* and discretion.

In these later days penicillin is one of those which is over used and greatly abused; in the eyes of the layman it is the panacea for a variety of diseases—more particularly mastitis, no matter what the specific cause. In consequence this agent may do more harm than good. The dairy farmer, in particular, has an obsession for penicillin, requesting to be supplied with box after box and thereby reducing this valuable scientific agent to an empirical status. I think the time has now come for the profession to sound a note of warning of the dangers which follow the indiscriminate use of penicillin.—Yours faithfully, W. M. Scott, Fryern Hall, Bridgwater. *August 30th*, 1953.

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TETRACHLORETHYLENE

Sir,—Referring to A. W. Vaughan's report on faecal examinations in the dog in your issue of June 20th, 1953, I have in the past used tetrachlorethylene for ancylostoma in the dog with success. Since reading this report I have used it once but with apparently alarming symptoms. In this connection the case may be of interest to readers.

Subject.—Dog, 40 lb., in healthy condition though slack over the quarters. Faecal examination (as described by Vaughan) showed a "fair" number of ancylostoma eggs (the dog is my own).

Pre-medication.—As recommended by Vaughan for three days with a light diet the previous day.

Dose.—Three 1 c.c. capsules of tetrachlorethylene after fasting over night.

The dog was dosed at 9.30 a.m. and at 10.15 a.m. was given a teaspoonful of mag. sulph. in sugar and water.

At 12.30 the dog began to show symptoms of inco-ordination, restlessness and panting. When I saw it at 1 p.m. these symptoms had developed further and it was staggering about panting severely. An enema was given but with little result and this was repeated half-hourly until 3 p.m., a further dose of mag. sulph. also being given. By 3.30 the dog was perfectly normal, recovery starting at 2.45.

There was a marked smell of chloroform from the breath while the dog was showing the symptoms.

It is suggested that a laxative given for a day or two before medication would help to avoid the above symptoms as it is unlikely that the drug would then be held up in the intestines and absorbed.

This case is recorded so that those who may use the drug may be forewarned of possible resultant symptoms, which would be very alarming to a client.—Yours faithfully, A. H. A. Hamilton, Veterinary Department, Yola, Nigeria. *August 28th*, 1953.

PS.—Your issue of July 18th, page 454: "Report": Report of Veterinary Director General, Canada. Would it be possible to find out what type of trypanosomiasis occurred in Ontario, Canada, as this is of extreme interest to anyone concerned with the subject? —A. H. A. H.

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PARASITIC INFESTATION OF MEAT

Sir,—Before the second world war *Cysticercus bovis* (measly beef) was almost unknown in British cattle. To-day it is one of those parasitic diseases met with daily in the course of meat inspection. This position is said to have arisen following the influx of European refugees into this country during the war, and particularly their close connection with agriculture here. Similarly, *C. cellulosae* (measly pork) and Trichinosis have long been absent from British pigs.

Numerous Scandinavian Landrace pigs are now being imported into this country to "improve" our porcine breeds, although we have some excellent material in our native stock of pigs. We may be pardoned for wondering how long it will be before we have to institute a special inspection service for Trichinosis and measly pork in our abattoirs if these importations are to continue.—Yours faithfully, D. J. Anthony, High Lodge, Iverley, Stourbridge, Worc. *September 2nd*, 1953.